Alg. 2 Warm Up #12-4

Unit Circle Quiz first.

Find all the angles between 0 and 2π that are solutions to the following equation. Answer in exact radians.

1. $\sin x = \frac{\sqrt{3}}{2}$

2. $\cos \theta = -\frac{\sqrt{2}}{2}$

3. $\tan x = -1$

4. $\tan \theta = \frac{\sqrt{3}}{3}$

5. $\sin \theta = -1$

6. $\cos x = 0$

Get organized and staple up:

Week 12 Classwork

Warm up on top

7- # 139 ---> 142

Classwork turned in tomorrow after a short warm up.

HW Questions:

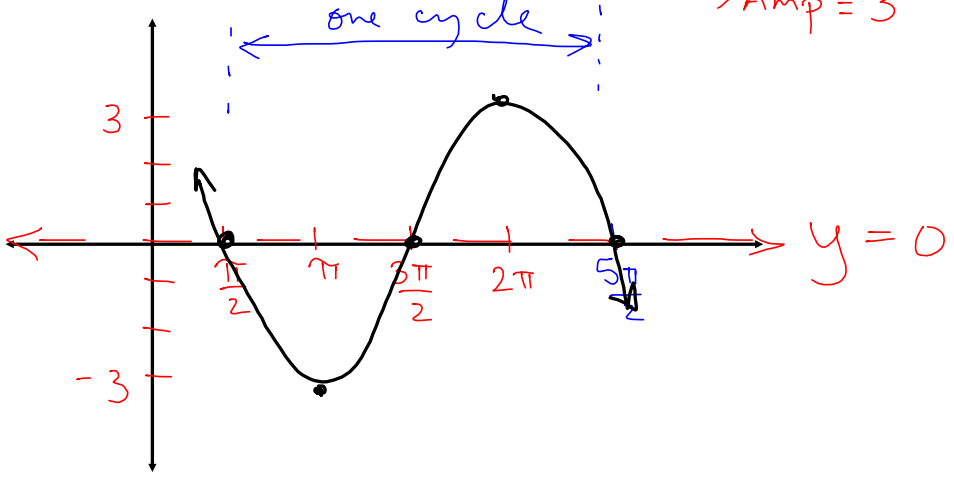
Convert from radians $\leftrightarrow$ degrees (No calculator)

1. $\frac{3\pi}{2}$ 2. $\frac{4\pi}{9}$ 3. 100° 4. 36°

Find the period, amplitude, equation for the line of oscillation (the midline), consider any reflections or shifts and sketch the graph:

5. $y = 4 + 2\cos x$

6. $y = -3\sin\left(x - \frac{\pi}{2}\right)$ — rx, Per $= 2\pi$, Amp $= 3$, Rt $\frac{\pi}{2}$



7. $y = \sin 2x + 1$

$b = 2$

$\frac{2\pi}{2}$

Per $= \pi$

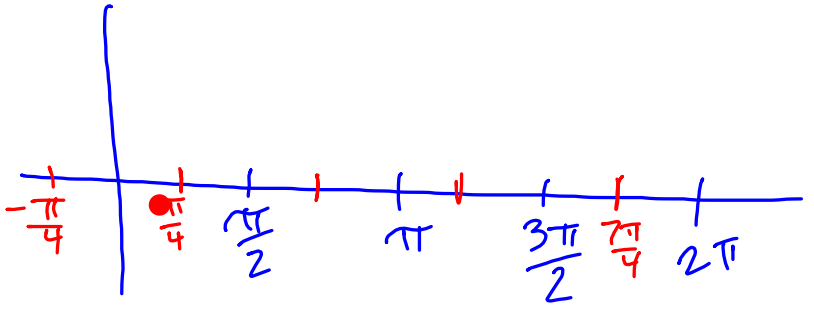
Amp $= 1$

line of Osc $y = 1$

8. $y = 3 + \sin\left(x + \frac{\pi}{4}\right)$

up 3 $\rightarrow$ line of osc $\rightarrow y = 3$

Left $\frac{\pi}{4}$ Amp $= 1$ Per $= 2\pi$

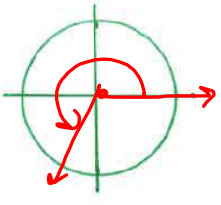
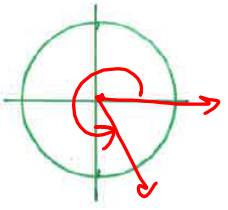
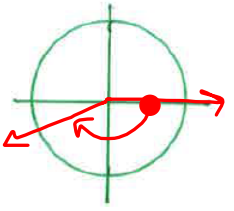
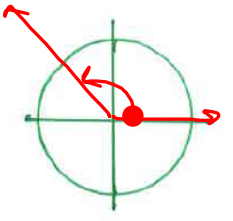


graph the first cycle between $-\frac{\pi}{4}$ and $\frac{7\pi}{4}$

March 08, 2018

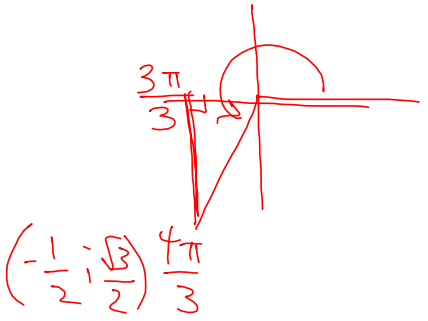
Draw the following angles on the unit circle:

9. $\frac{4\pi}{3}$ 10. $\frac{10\pi}{6} = \frac{5\pi}{3}$ 11. $-\frac{5\pi}{6}$ 12. $\frac{3\pi}{4}$

Use your unit circle to find:

13. $\sin\frac{7\pi}{4}$ 14. $\cos\frac{4\pi}{3}$ 15. $\tan\frac{\pi}{2}$ 16. $\sin\left(-\frac{\pi}{6}\right)$



$\frac{1}{0}$

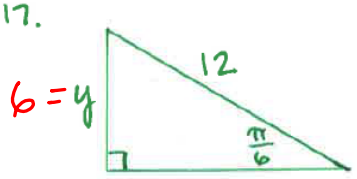
undefined

Same as $\frac{11\pi}{6}$

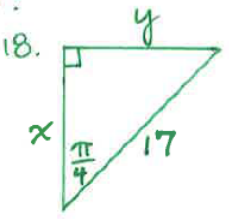
$-\frac{1}{2}$

Find x & y exact:

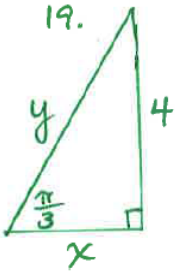
17.



18.

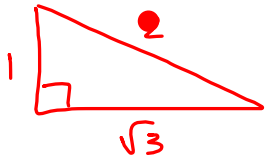


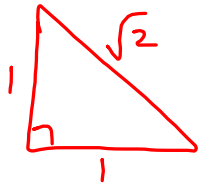
19.



20. If $\cos\theta = -\frac{\sqrt{3}}{2}$

Find θ





hyp = leg $(\sqrt{2})$

$17 = x\sqrt{2}$

$x = \frac{17}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$

$x = \frac{17\sqrt{2}}{2}$

long leg = sh. leg $(\sqrt{3})$

$4 = x(\sqrt{3})$

$\frac{4}{\sqrt{3}} = x$

$x = \frac{4\sqrt{3}}{3}$

double for hypotenuse!

Describe the transformations of the parent graph to get:

21. $y = -2 + 4\cos(2x - \pi)$

down 2; vertical stretch; $\cos 2(x - \frac{\pi}{2})$; horizontal compression; Rt $\frac{\pi}{2}$

22. $y = -\frac{1}{3}\sin x + 8$

reflection in the x-axis; vertical compression; up 8

23. $y = \tan(x - \frac{\pi}{6}) - 4$

24. $y = \frac{2}{3}\cos(4x + \pi)$

$4(x + \frac{\pi}{4})$

Solve. Answer exact & simplified.

25. $3^{x+5} \cdot 9 = 3^{4x}$

$3^{x+5} \cdot 3^2 = 3^{4x}$

$3^{x+7} = 3^{4x}$

$x+7 = 4x$

$7 = 3x$

$\boxed{x = \frac{7}{3}}$

26. $4\log_3 2 = \log_3 x + \log_3 2x$

$\log_3 2^4 = \log_3 2x^2$

$16 = 2x^2$

$x^2 = 8$

$x = \pm\sqrt{8}$

$x = \pm 2\sqrt{2}$

$-2\sqrt{2}$ ← extraneous

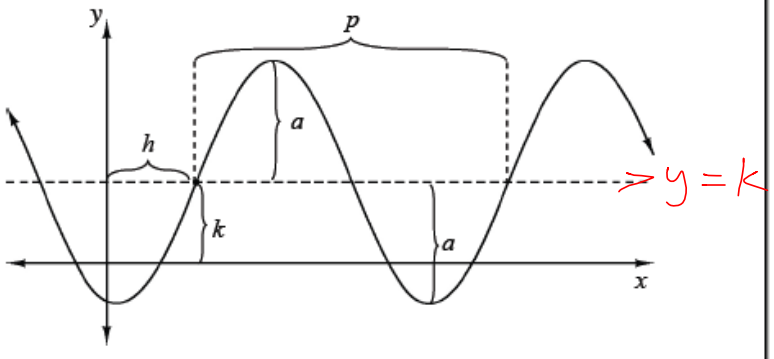
$\boxed{x = 2\sqrt{2}}$

MATH NOTES

METHODS AND MEANINGS p. 360

General Equation for Sine Functions

The general equation for the **sine function** is $y = a\sin[b(x-h)]+k$.



The **amplitude** (half of the distance between the highest and the lowest points) is ***a***. Vertical stretch or compression

Per $= \frac{2\pi}{b}$

The **period** is the length of one cycle. It is labeled ***p*** on the graph.

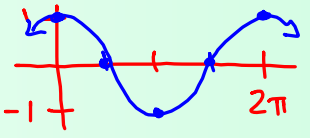
The number of cycles in 2π is ***b***.

The **horizontal shift** is ***h***.

The **vertical shift** is ***k***. The **midline** is $y = k$.

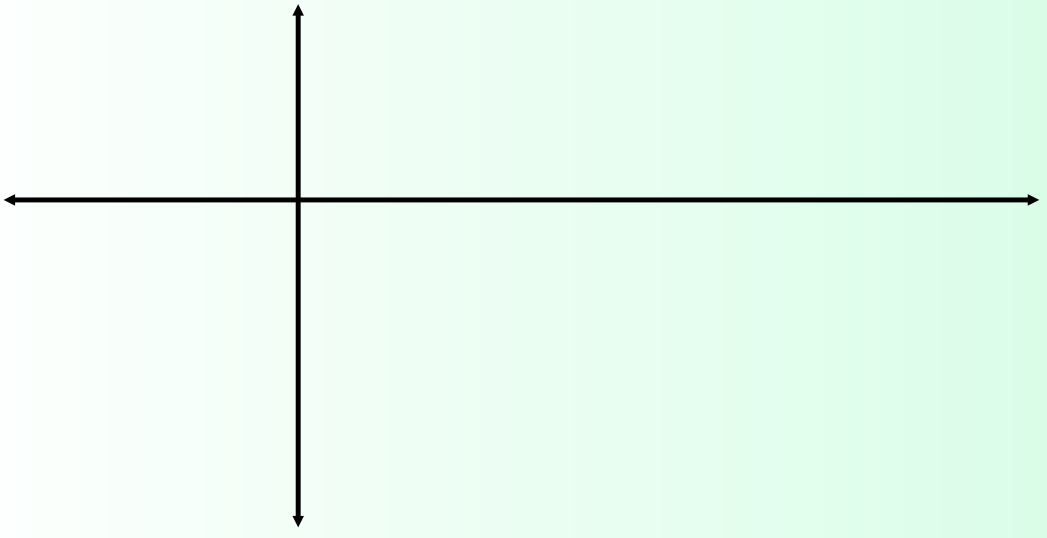
Practice:

Parent: $y = \cos x$



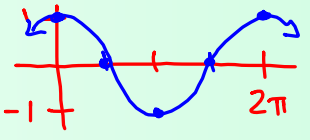
Describe the transformations of $y = \cos x$ that give us $y = 3 \cos (2x - \pi) - 2$, then graph one cycle.

Label the line of oscillation.



Practice:

Parent $y = \cos x$



Vertical stretch of 3

Describe the transformations of $y = \cos x$ that give us $y = 3\cos(2x - \pi) - 2$, then graph one cycle.

$2\left(x - \frac{\pi}{2}\right)$ → down 2

R+ $\frac{\pi}{2}$

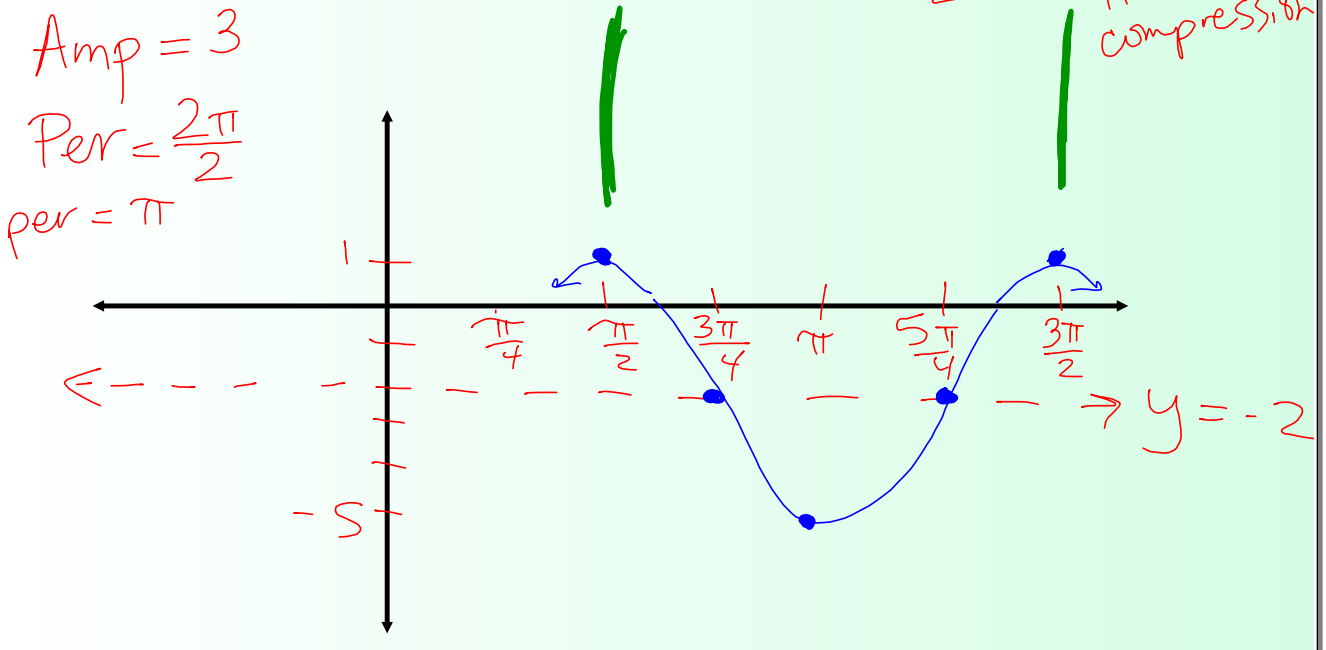
Label the line of oscillation.

Horiz compression

Amp = 3

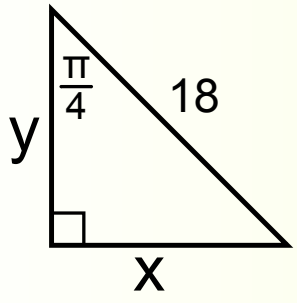
Per = $\frac{2\pi}{2}$

per = π

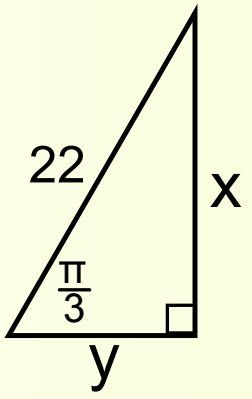


Find x and y, exact and simplified.

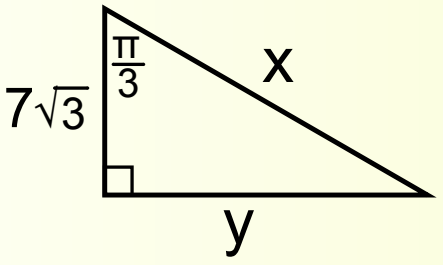
1)



2)

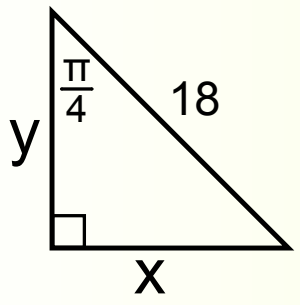


3)



Find x and y, exact and simplified.

1)



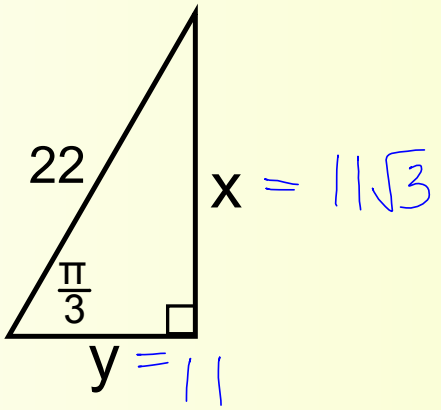
hyp = leg($\sqrt{2}$)

$18 = x\sqrt{2}$

solve for x

$x = y = 9\sqrt{2}$

2)



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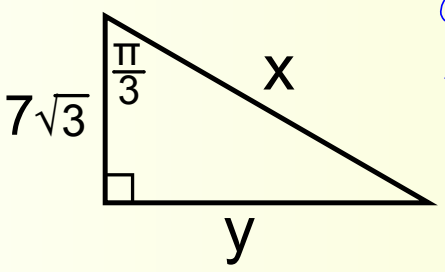

hyp = 2(sh leg)

$x = 2(7\sqrt{3})$

$x = 14\sqrt{3}$

long leg = (sh leg)$\sqrt{3}$

$y = 7\sqrt{3} \cdot \sqrt{3}$

$y = 21$

Practice:

1) $\log_2(5x + 6) = 3$

2) $\log_4(x - 6) + \log_4 x = 2$

3) $2 \log_3(x + 1) = 2$

Practice:

1) $\log_2(5x + 6) = 3$

$2^3 = 5x + 6$

$8 = 5x + 6$

$2 = 5x$

$x = \frac{2}{5}$

2) $\log_4(x - 6) + \log_4 x = 2$

$\log_4(x^2 - 6x) = 2$

$4^2 = x^2 - 6x$

$0 = x^2 - 6x - 16$

$0 = (x - 8)(x + 2)$

$x = 8, -2$

3) $2\log_3(x + 1) = 2$

$\log_3(x+1)^2 = 2$

$3^2 = x^2 + 2x + 1$

$0 = x^2 + 2x - 8$

$0 = (x + 4)(x - 2)$

$x = -4, 2$

HW: Checkpoint 10,

problems are on p. CP 25

1 - 25 odd

In the checkpoint section, back of the book.
This is final exam review of logs.

Chapter Test: Tomorrow

(No calculator)